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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/21/2005

Andreas Lendlein

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KALOW & SPRINGUT LLP  
488 MADISON AVENUE  
19TH FLOOR  
NEW YORK, NY 10022

EXAMINER

HELM, CARALYNNE E

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/511,019	<b>Applicant(s)</b> LENDLEIN ET AL.	
	<b>Examiner</b> CARALYNNE HELM	<b>Art Unit</b> 1615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 2, 11-18 and 20-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-10, 19 and 28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☒ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Note to Applicant: References to paragraphs in non-patent literature refers to full paragraphs (e.g. 'page 1 column 1 paragraph 1' refers to the first full paragraph on page 1 in column 1 of the reference)

### ***Election/Restrictions***

To summarize the current election, applicant elected group I and the species where the macromer is poly( $\epsilon$ -caprolactone) dimethacrylate and the additional macromer is poly(ethylene glycol) acrylate

### **MAINTAINED REJECTIONS**

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 7, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed.

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Cir. 1999). The phrase, "macromer having only one chemically reactive group" in claims 7 and 10, is used by the claim to mean "macromers with one easily reacted group (e.g. alkene, amine, etc.)", while the accepted meaning is "macromers with literally only one chemically reactive group". The term is indefinite because the specification does not clearly redefine the terminology. Further limitation of the claim that occurs in dependent claims recite monomers which include poly(ethylene glycol) acrylate, that are supposed to be part of this set. Polyethylene glycol has hydroxyl groups at both termini. Thus polyethylene acrylate would still contain a hydroxyl group on one end, which is a chemically reactive group. For the sake of application of prior art, the elected additional macromer is interpreted to meet the recited limitation.

Claims 4 recite that the at least one cross-linkable macromer "forms after crosslinking a shape memory polymer", then go on to further describe the macromers. The instant specification recites that that macromers are crosslinked in order to provide a shape memory polymer (see page 6 line 23-page 7 line 15). No description is provided to detail how the formation of the macromers occurs *after* a shape memory polymer is crosslinked (e.g. starting materials, reaction conditions, steps involved, etc.). Taken together, these recitations appear to be contradictory and are quite confusing. For the sake of application of prior art the process of generating the macromer is not interpreted to be a part of the claimed method.

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***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 3-10, 19, and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10 and 15 of copending Application No. 10/510873. Although the conflicting claims are not identical, they are not patentably distinct from each other because both claim the same method of treating and shaping hair where the same two classes of macromers are applied the hair. In particular, poly( $\epsilon$ -caprolactone) dimethacrylate and polyethylene glycol acrylate are both taught as the macromers. Further, both applications claim the cold forming of treated hair. Thus instant claims 1, 3-10, 19, and 26 are obvious over claims 1-10 and 15 of copending Application No. 10/510873.

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This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The four factual inquiries of *Graham v. John Deere Co.* have been fully considered and analyzed in the rejections that follow.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3-10, 19, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. (US Patent No. 5,506,300) in view of Tatsuro et al. (Patent Abstracts of Japan 04-0414116 – see IDS), Herz et al. (US Patent No. 3,579,630), Lendlein et al. (WO99/42528 – see IDS – referred to henceforth as Lendlein et al. reference A), Lendlein et al. (Proceedings of the National Academy of Sciences 2001 98:842-847 – see IDS – referred to henceforth as Lendlein et al. reference B), and Dykstra et al. (US PGPub No. 2008/0057021).

The invention of the instant application involves two primary parts, 1) a method of changing the shape of hair after applying a shape memory composition and 2) poly( $\epsilon$ -caprolactone) dimethacrylate and poly(ethylene glycol) monoacrylate as the particular macromer combination in the shape memory composition. The concept and process of changing the shape of hair is made obvious by the teachings of Ward et al. in view of Tatsuro et al. and Herz et al. The combination of macromers present in the shape memory composition are made obvious by Lendlein et al. reference A in view of Lendlein et al. reference B and Dykstra et al. Discussion of the details of these references as well as the motivation to combine them is presented below.

Ward et al. teach the process of modifying the shape of doll hair that comprises a shape memory polymer (see column 12 line 51-column 13 line 44; instant claim 1). Here

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the polymer containing fiber is formed into a first shape and heated above its lower transition temperature (see column 13 lines 29-36). Subsequently the fiber is cooled and formed into a second shape (see column 13 lines 36-38; instant claims 3 and 19). Upon heating above the lower transition temperature, the fiber returns to the first shape (see column 13 lines 38-44; instant claim 28). Although Ward et al. teach the formation of the hair from the polymer, they do not teach the application of shape memory polymer to hair. Since it was known at the time of the invention that the form and shape of hair can be controllably altered due to the presence of shape memory polymers, it would have been obvious to one of ordinary skill to translate this method from synthetic hair to natural hair. Both Tatsuro et al. and Herz et al. teach the application of compositions comprising shape memory polymers to confer curl retention to styled natural hair (see Tatsuro et al. abstract and Herz et al. column 1 lines 64-68; instant claims 1 and 28). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a shape memory polymer to hair and subject it to the shape changing method taught by Ward et al. Therefore the claimed method of changing the shape of hair after applying a shape memory composition is obvious over Ward et al. in view of Tatsuro et al. and Herz et al.

Ward et al. in view of Tatsuro et al. and Herz et al. do not teach a shape memory polymer composed of poly( $\epsilon$ -caprolactone) dimethacrylate and poly(ethylene glycol) monoacrylate macromers.



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Lendlein et al. reference A teach poly( $\epsilon$ -caprolactone) dimethacrylate as a shape memory polymer (see page 34 example 2 and page 37 shape memory properties section; instant claims 1 and 4-6). Lendlein et al. reference A goes on to teach the polymers of their invention for use in dolls and cosmetic compositions for human use (see page 28 lines 7 and 13). Lendlein et al. reference B teach this same polymer used as a macromer along with n-butyl acrylate, as a comonomer, to create a biocompatible shape memory polymer (see page 842 column 1 paragraph 4-column 2 line 2 and page 843 column 1 paragraph 1; instant claims 1 and 7). The comonomer is taught to confer softness to the final polymer, which is an attribute that would be desirable in a hair/cosmetic composition (see page 842 column 1 paragraph 4). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include poly( $\epsilon$ -caprolactone) dimethacrylate and n-butyl acrylate as monomers/macromers in a shape memory hair/cosmetic composition. Lendlein et al. reference A in view of Lendlein et al. reference B do not teach poly(ethylene glycol) monoacrylate as a comonomer (macromer) to include with poly( $\epsilon$ -caprolactone) dimethacrylate.

Dykstra et al. teach a personal care composition used on hair (see paragraph 20). Within this composition is taught a polymer where the monomers are selected from a set of non-cationic compounds (see paragraph 146; instant claims 7-10). In this set of monomers, poly(ethylene glycol) monoacrylate and n-butyl acrylate are equivalent choices. Since both these compounds are known for interchangeable use as monomers that compose a polymer in a hair composition and have a single acrylate group, it would

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have been obvious to one of ordinary skill in the art at the time the invention was made to use poly(ethylene glycol) monoacrylate instead of n-butyl acrylate in the composition of Lendlein et al. reference A in view of Lendlein et al. reference B. Therefore the claimed combination of poly( $\epsilon$ -caprolactone) dimethacrylate and poly(ethylene glycol) monoacrylate, as particular macromers in the shape memory composition, was obvious over Lendlein et al. reference A in view of Lendlein et al reference B and Dykstra.

Since the combination of poly( $\epsilon$ -caprolactone) dimethacrylate and poly(ethylene glycol) monoacrylate as macromers in shape memory hair/cosmetic composition was an obvious option, it would also have been obvious to use it in a method of changing the shape of hair after applying a shape memory composition. Therefore claims 1, 3-10, 19, and 28 are obvious over Ward et al. in view of Tatsuro et al., Herz et al., Lendlein et al reference A, Lendlein et al. reference B and Dykstra et al.

### ***Response to Arguments***

Applicants' arguments, filed April 3, 2009, have been fully considered.

The rejections of claims 3, 8, and 10 under 35 USC 112, second paragraph have been reconsidered in light of the arguments and are hereby withdrawn.

In light of the amendments, the objections to claim 10 and drawings are hereby withdrawn.

Applicant's willingness to file a terminal disclaimer should allowable subject matter be identified in the instant case is noted.

*Regarding rejections under 35 USC 112, second paragraph:*

Applicant argues that the language of claims 7 and 10 is not indefinite. This is not found to be persuasive because applicant has not disputed the argument presented that particular compounds enumerated in claim 10 do not meet the limitations of claim 7 (“a macromer having only one chemically reactive group”) from which it depends.

Applicant argues that the language of claim 4 is adequately supported by the specification and is not indefinite. This argument does not address the merit of the issue presented nor does it demonstrate where the limitation is elaborated upon in the specification such that one of ordinary skill in the art would be able to discern what is meant. The claim recites that the at least one crosslinkable macromer is formed after crosslinking a shape memory polymer; however, the specification does not define this polymer starting material. Instead the shape memory polymer is taught to be formed from crosslinkable macromers. Therefore the claim limitations do not distinctly point and specifically claim their subject matter.

*Regarding rejections under 35 USC 103(a):*

Applicant argues that there are inherent differences between synthetic hair and natural hair such that one skilled in the art would not expect the two to behave in the same fashion when treated in the same manner. Although applicant’s intent may have been for the method to apply only to natural hair, the claims do not recite that the hair must be natural hair. The claims simply recite application of the method to “hair”. In addition, the concept of utilizing shape memory polymers to control the shape of hair was known at the time of the invention for both natural and synthetic hair, as

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demonstrated by Ward et al., Tatsuro et al. and Herz et al. Therefore it would have been reasonable for one of ordinary skill in the art to expect shape memory polymers to facilitate shaping and styling of natural hair at the time of the invention. The additional teachings provided by Lendlein et al. reference A, Lendlein et al. reference B, and Dykstra et al. teach polymer containing compositions within the same context and would have been obvious to combine at the time of the invention.

### ***Conclusion***

No claim is allowed.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARALYNNE HELM whose telephone number is

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(571)270-3506. The examiner can normally be reached on Monday through Thursday 8-5 (EDT).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on 571-272-8373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Caralynne Helm/  
Examiner, Art Unit 1615

/MP WOODWARD/  
Supervisory Patent Examiner, Art Unit 1615